

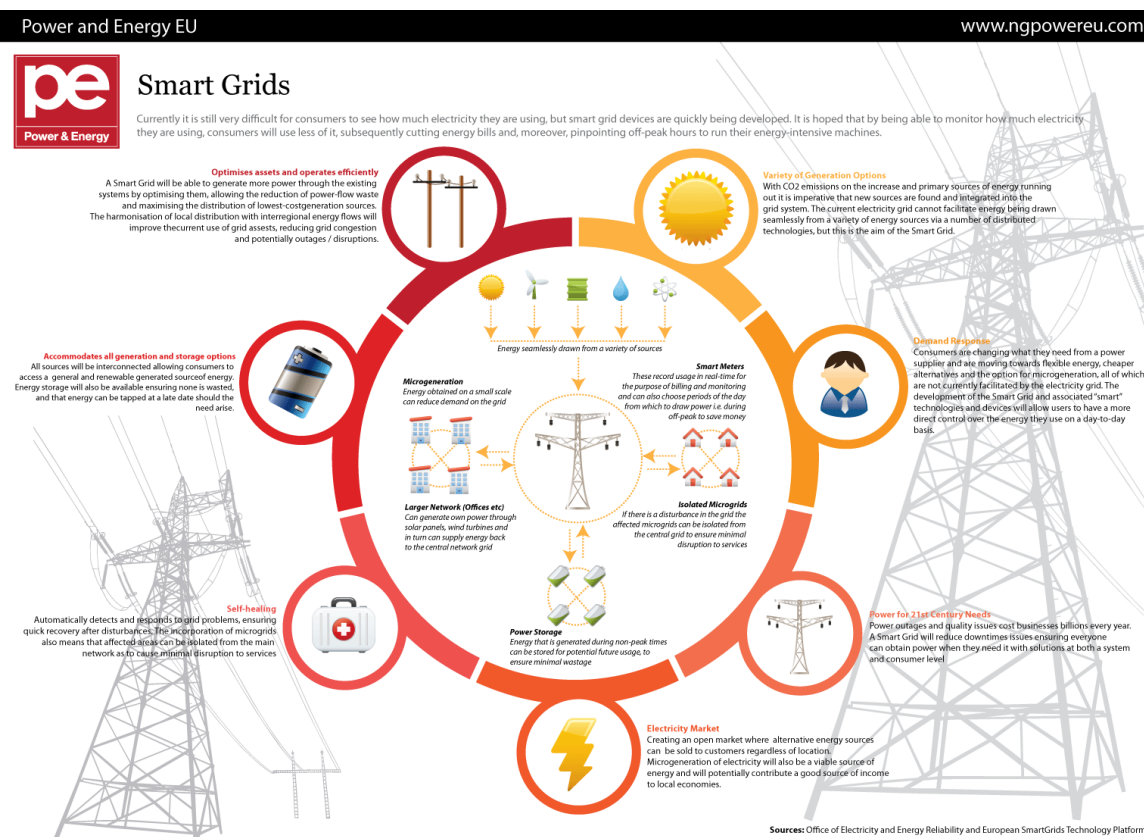
# Electrical Energy Systems M – Technical Essay

Students on M level courses are required to show a deeper understanding of course material than level 4 students, and to be able to put that material into an industrial context.

In order to show this deeper level of understanding, 20% of the final mark for Electrical Energy Systems M will result from the writing of a Technical Essay on an Energy topic.

## Technical Essay Assignment

**Considering the Net-Zero context**, explain and discuss the following topics on Smart Grid (choose any one topic) from a technical perspective:



- Variety of generation options (distributed generation) – focusing on the renewable power generation integration
- Demand-side response (electric vehicles charging and V2G) – focusing on low-carbon demands
- Power outages and quality issues (protection / power conditioning) – focusing on how net-zero is going to affect the power quality
- Electricity market (electricity trading practices) – focusing on the changes of market to fit for net-zero requirements
- Self-healing (microgrids) – focusing on the carbon emission aspect of microgrids
- Accommodates all generation and storage options (energy storage management) – focusing on low-carbon energy storage technologies
- Optimises assets and operates efficiently (ICT and smart meters) – focusing on optimising carbon emissions

In your response include references to general low-carbon and Smart Grid concept and the technical topic you've chosen. Your report can be a technical review of a problem, a solution, or a combination of the two. Use annotated sketches and diagrams to illustrate your response.

### **Logistics**

You must upload an electronic copy of your written Essay and this will become your final version once the 'submit' button is pushed. The final copy must be submitted online by 12:00 noon on Monday 21<sup>st</sup> March 2022. **Please use your student ID in the filename of your submission**, along with a electronically signed Declaration of Originality.